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ABSTRACT

This brief document presents the sixth-grade mathematics curriculum specifications for Alberta schools, developed by a committee of teachers, consultants, and provincial department personnel. The guidelines for the specifications are listed, followed by a table noting the percent of emphasis on numeration, operation and properties, measurement, geometry, graphing, problem-solving skills for each area, psychomotor skills, and attitudes. The next table indicates the percent of emphasis on each major objective for each subject matter area. Finally, suggested problem-solving strategies are listed. (MNS)

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GRADE 6 MATHEMATICS CURRICULUM SPECIFICATIONS

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CURRICULUM BRANCH

Alberta
EDUCATION

May 1986

GRADE 6 MATHEMATICS CURRICULUM SPECIFICATIONS

The Mathematics Curriculum Specifications for Grade 6 were prepared in September, 1982, by a committee of classroom teachers, consultants, and Alberta Education personnel under the direction of the Curriculum Branch. Alberta Education acknowledges with appreciation the contributions of the following members of the Grade 6 Mathematics Committee:

A. Anderson, Alberta Education, Chairman
G. Popowich, Alberta Education
W. Lencucha, Alberta Education
B. Bober, Edmonton Catholic School Board
S. Shamchuk, Edmonton Public School Board
E. Dach, County of Strathcona
M. Johnson, Taber School Division
C. Knauft, Peace River School Division
M. Bye, Calgary Public School Board

The following considerations determined the final Curriculum Specifications for Grade 6:

1. The specifications were based on the *Program of Studies for Elementary Schools*, September, 1982.

2. The content emphasis to be placed on each of the four components that make up the elementary mathematics program is reflected in the charts on pages 3 and 4.

3. The problem-solving and psychomotor skills components are viewed as integrative within the subject matter dimension and should not be treated as separate entities. The relative emphases of problem-solving and psychomotor skills with each of the five subject matter (concept) strands are reflected on pages 3 and 4.

4. The attitude component is viewed as being pervasive throughout the total program.

5. The relative emphasis to be placed on the subject matter statements within each of the five concept strands is given on pages 5 to 7.

6. Three taxonomic classifications for subject matter component were suggested and defined by the committee:

   Knowledge

   - Testing for knowledge includes exercises involving immediate recall and routine manipulation. This level represents primarily the outcomes which require of the student no decision making or complex memory.

Comprehension

- Knowledge of concepts: A concept is an abstraction and as such requires complex decision making.

- Translations: Comprehension involves translating from the concrete to pictorial to symbolic, or in reverse order.

Application

- Includes the ability to solve problems involving learned skills and concepts.

- Involves the ability to recognize patterns and relationships.

CONTENT EMPHASES

	Per Cent Emphases
SUBJECT MATTER	60
Numeration	15
Operation & Properties	25
Measurement	10
Geometry	5
Graphing	5
PROBLEM-SOLVING SKILLS (APPLICATIONS)	20
Numeration	4
Operations & Properties	4
Measurement	4
Geometry	2
Graphing	1
Developing a problem-solving model and strategies	5

	Per Cent Emphases
PSYCHOMOTOR SKILLS (APPLICATIONS)	10
Measurement	4
Geometry	5
Graphing	1
ATTITUDES	10

SUBJECT MATTER EMPHASES

	Per Cent Emphases
Numeration	15
- Identifies and names place value to billions (0.0001 - 1 000 000 000)	3
- Writes decimal numerals using expanded notation	1
- Rounds numbers (0.0001 - 999 999 999)	2
- Identifies and uses proportional ratios	2
- Expresses halves, quarters, and fifths as fractions or decimals	2
- Expresses fractions and decimals as per cents and vice versa	2
- Identifies and orders integers	1
- Reads, writes, and orders whole numbers and decimals (0.0001 - 1 000 000 000)	2
Operations and Properties	25
- Adds and subtracts whole numbers and decimals, and estimates sums and differences	4
- Demonstrates mastery of basic facts. Separate timed tests	5
- Multiplies whole numbers and decimals using one, two, and three-digit multipliers, and estimates products	4
- Divides whole numbers and decimals using one, two, and three-digit whole number divisors	4
- Divides whole numbers and decimals using one decimal place divisors	3
- Checks multiplication by division and division by multiplication.	1
- Mentally computes simple addition, subtraction, multiplication, and division	1
- Calculates averages and percentages	3

	Per Cent Emphases
Measurement	10
- Finds perimeters of polygons with and without formulas	1
- Finds areas of triangles and rectangles using formulas	1
- Finds volumes of rectangular solids using formulas	1
- Reads and determines distances according to a scale	1
- Draws diagrams according to a scale	0
- Reads the 24-hour clock and writes corresponding time notation	1
- Understands and uses the system of metric prefixes, including use of symbols: kilo, hecto, deca, BASIC Units, deci, centi, milli	2
- Expresses equivalent measures within units of length, capacity, mass, and time with symbols	2
- Measures angles	1
Geometry	5
- Constructs and draws prisms, pyramids, cones, and cylinders	1
- Draws and identifies radius, diameter, and circumference	0
- Translates, rotates, reflects, and enlarges 2-dimensional figures	1
- Identifies and tests congruency using translations (slides), reflections (flips), and rotations (turns)	1
- Names corresponding sides, vertices, angles of congruent polygons	1
- Identifies and names intersecting lines, parallel lines, perpendicular lines, and angles	1

	Per Cent Emphases
Graphing	5
- Constructs pictographs, bar, and line graphs	1
- Interprets and solves problems using pictographs, bar, line, and circle graphs	1
- Locates points in all four quadrants	1
- Generates and graphs ordered pairs from a given relationship (no negative numbers)	2

SUGGESTED PROBLEM-SOLVING STRATEGIES

1

Understanding the Problem

- Using manipulatives
- Interpreting pictures
- Looking for patterns
- Identifying key words
- Acting it out
- Drawing diagrams
- Restating the problem in your own words
- Asking relevant questions
- Identifying wanted, given, and needed information
- Identifying extraneous information
- Considering alternative interpretations

2

Developing a Plan

- Acting it out
- Using manipulatives
- Collecting and organizing information (charts, graphs)
- Applying patterns
- Choosing and applying the appropriate operation
- Writing and solving a number sentence
- Guessing and checking
- Identifying and applying relationships
- Making diagrams and models
- Using a simpler problem
- Using logic or reason
- Constructing flow charts

3

Carrying out the Plan

- Acting it out
- Using manipulatives
- Collecting and organizing information (charts, graphs)
- Applying patterns
- Choosing and applying the appropriate operation
- Writing and solving a number sentence
- Guessing and checking
- Identifying and applying relationships
- Making diagrams and models
- Using a simpler problem
- Using logic and reason
- Constructing flow charts

4

Looking Back

- Stating an answer to the problem
- Restating the problem with the answer
- Checking the answer
- Determining the reasonableness of the answer
- Explaining the answer
- Reviewing the solution process
- Considering the possibility of other answers
- Looking for alternative ways to solve the problem
- Making and solving similar problems
- Generalizing solutions